NASA SBIR/STTR Technologies

A2.01-8521 - An Uninhabited Aerial System Safety Analysis Model (USAM)

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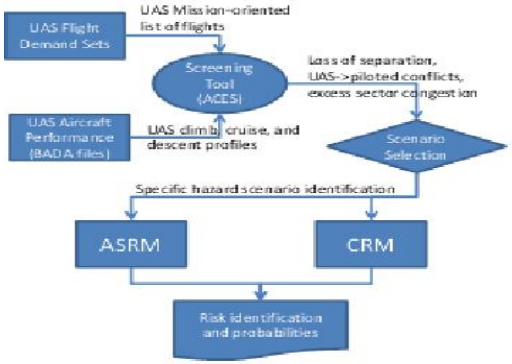
Identification and Significance of Innovation

The National Airspace System (NAS) in the United States will become a complex array of commercial and general aviation aircraft, unmanned aircraft systems, reusable launch vehicles, rotorcraft, airports, air traffic control, weather services, and maintenance operations, among othersThis increased system complexity necessitates the application of systematic safety risk analysis methods to understand and eliminate where possible, reduce, and/or mitigate risk factors. The product of this effort is the development of an Uninhabited Aerial System (UAS) safety analysis model, (USAM). USAM is an extension of current efforts underway by the UAS community, extending these efforts by incorporating UAS scenarios and encounter geometries to populate existing safety analysis models, thereby producing credible future UAS safety metrics



Estimated TRL at beginning and end of contract: (Begin: 1 End: 2)

Technical Objectives and Work Plan

There are two primary technical objectives of Phase I: (1) leveraging upon existing work that has been funded by NASA, combine the screening tool, ASRM, and CRM into an integrated UAS Safety Analysis Model (USAM), and (2) demonstrate the utility of USAM by actually computing risk probabilities for scenario(s) of interest.
Work Plan:
In order to meet these technical objectives, the following proposed tasks comprise Phase I of the project.
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Identify the specific scenario to be analyzed by ASRM and CRM.
Hazard Identification and Safety Risk Modeling in ASRM
Configure and Run the Collision Risk Model (CRM).
Run ASRM and CRM and compute loss probabilities.
Write final report

NASA Applications

USAM will represent a valuable analysis tool that NASA researchers can use to assess the safety component of their proposed future NAS configurations, including future NextGen improvements. With the existence of USAM, safety analysis including UAS vehicles will become a possible, and ultimately required, part of all future NextGen analyses. The demand, therefore, by the research community for USAM is expected to be high.

Non-NASA Applications

Federal Aviation Adminstration (FAA). The FAA will require a system to methodically compute the probabilities of hull loss, separation violations, collisions, and the risk to the public, before approving any change to the NAS which allows UAS flights..
Other government and commercial. Any government agency or commercial organization considering using UAS in the civilian airspace for their wor

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